

Find an equation of the tangent line to the graph of f at the given point.

1. $y = x^3 - 2x$ at $(1, -1)$

2. $y = x^3 + 2x^2 - 3$ at $(-1, -2)$

3. $y = \frac{1}{x^2}$ at $\left(2, \frac{1}{4}\right)$

4. $y = \sqrt[3]{x}$ at $(-1, -1)$

Find all points on the graph, if any, at which there is a horizontal tangent line.

5. $f(x) = -2x^3 - 6x^2 + 5$

6. $y = \frac{1}{3}x^3 - \frac{3}{2}x^2 + 2x$

7. $y = x^3 - 5x^2 - 8x - 3$

8. $g(x) = x^4 - 6x^2 + 3$

Questions 9 – 12. Use the table to write the equation for tangent lines at given values of x . Given the differentiable functions $f(x)$ and $g(x)$:

x	$f(x)$	$g(x)$	$f'(x)$	$g'(x)$
-1	-2	4	0	3
2	-5	0	-3	DNE

9. Tangent of $f(x)$ at $x = 2$

10. Tangent of $f(x)$ at $x = -1$

11. Tangent of $g(x)$ at $x = -1$

12. Tangent of $g(x)$ at $x = 2$

13. Find the equation of the line tangent to the graph of $f(x) = 5x - x^2$ at the point where $f'(x) = -3$

14. At what point on the graph of $y = 2x^2$ is the tangent line parallel to the line $2x - 4y = 7$

15. Given $f(x) = x^2 - kx$, find the value(s) of k , such that the line $y = 7x - 9$ is tangent to the graph of the function.